2020 Customer Training Catalog

Training options to meet your needs.

Johnson Controls

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Course Details and Information

About the Johnson Controls Training Institute

Since 1947, the Johnson Controls Training Institute has been helping people succeed at creating and managing quality building environments. The Training Institute partners with engineering schools, technical colleges, and experts in the building environments industry. This allows us to provide high-quality learning experiences that reflect both the current state of the industry today and the direction its heading in the future.

Our curriculum has been developed by professional instructors who are experienced in the building environments industry. Their extensive real-world experience and ability to share their knowledge in a structured format assures you an enlightening and productive educational experience.

- Learn from Certified Instructors* with years of industry experience
- Experiment in our labs, using specially designed equipment simulators
- Find the learning opportunities
- Expand your knowledge in industry topics such as:
  - Building Automation Systems
  - Energy Management
  - Heating, Ventilating, and Air Conditioning Systems
  - Preventative Maintenance
  - Automated Building Controls

Because your goal is to apply what you've learned, our state-of-the-art facilities include fully equipped labs for hands-on exercises. Portable equipment simulators enable the Training Institute to bring many of its courses to your location, yet still enable you to practice what you've learned without jeopardizing building operations.

Our comprehensive and cost-effective programs are designed for anyone who needs a working knowledge of environmental systems, including:

- Building Owners
- Building Managers
- Engineers
- Operators
- Maintenance Technicians
- Property Managers

**Johnson Controls Training Institute instructors are certified on the technical and application objectives of each course, while referencing the core instructor competencies summarized by the International Board of Standards for Training, Performance, and Instruction (IBSTPI) Instructor Competencies – The Standards (Volume 1) ©2003, all rights reserved.*

TRAINING OPTIONS TO MEET YOUR NEEDS

Our learning opportunities are designed to provide you with the knowledge and skills necessary to effectively and efficiently operate your building's systems. By using your newly acquired abilities, you can maximize the potential of your building systems and increase your return on investment. To help you take advantage of the benefits of our training, we offer several ways to approach our courses. You can select from our:

Training Institute Courses (Scheduled)

Regularly scheduled courses with both a classroom and lab component are conducted at our ten Johnson Controls Training Institute locations. During class you will be using an iPad® to take notes and highlight the material. When class ends you will take your notes and course material with you on a USB Drive. The descriptions of the regularly scheduled courses begin on page 13. Refer to the Class Schedule available at **www.johnsoncontrols.com/institute** for the dates, locations, and prices of these courses. Note: No audio/visual recording equipment is allowed.

Instructor-Led Distance Learning Courses and Learning Packages

Learn in the convenience of your own home, office, or work location using Johnson Controls instructor-led distance learning courses or learning packages. Learning packages include self-study workbooks offering flexible, effective, cost-efficient opportunities to build knowledge and skills. Our instructor-led distance learning courses and learning packages can be used as preparation for a course, to refresh skills, or to provide an effective learning alternative if attendance at a typical classroom course is impractical. The list of instructor-led distance learning courses are on page 29 and information about our learning packages begins on page 36.

Courses Offered By Request Only

Some of our courses target a more specific audience and therefore, have lower demand. To continue to satisfy the needs of those who still occasionally need these courses, selected courses are only conducted upon request. These courses can be conducted at your site or at one of our eleven Training Institute locations. For this reason, these courses are not included on the schedule. To inquiry about scheduling a course, contact the Learning Institute at 414-524-4286 or **cg-customer.registrar@jci.com**.

Onsite Learning Programs

Johnson Controls Training Institute can help you make the most of your investment in learning by bringing our instructors and classes to you or to the location of your choice. More and more companies are realizing the value of bringing training Onsite. Our onsite Courses can be the most efficient and cost-effective way to train as few as eight employees.

Onsite Courses offer a number of advantages:

- Smaller class size allows for more individualized attention
- Economical as one instructor travels instead of eight or more students
- Consistency among employees who learn together as a group

To ensure the success of an onsite Course, you provide:

- A minimum of eight students
- A suitable room for training

Johnson Controls Training Institute will provide:

- Specially designed portable equipment simulators and computers
- USB jump drives with course and reference material for all student

ENROLLMENT INFORMATION

ONLINE ENROLLMENT

To browse our catalog and enroll for our courses, please visit our website: www.jcitraininginstitute.com

For more information, call or fax:
414-524-4286 or 800-524-8540
877-403-6625 (fax)
Email: cg-customer.registrar@jci.com

Payment:
Payment can be made using Visa®, MasterCard® or American Express®.
All necessary course materials are included in the tuition listed in each course description.

Schedule of Classes

The 2020 schedule of classes is available at **www.johnsoncontrols.com/institute**. The schedule is subject to change.

Vouchers

Enjoy savings and flexibility by ordering a pack of vouchers good for any classes without enrolling specific students at this time. For ordering information, call 800-524-8540. (Vouchers cannot be used for course #4720 Facility Explorer Supervisory Controllers Engineering/N4 Certification.

- A 10-pack of training vouchers is **$19,000**. Vouchers are good for two years from the date of purchase and must be used for regularly scheduled Training Institute classes.
- A 5-pack of training vouchers is **$11,000**. Vouchers are good for one year from the date of purchase and must be used for regularly scheduled Training Institute classes.
- The Personal 3-Pack is valid for a specified individual for any three classes and is good for one year from the date of purchase. The Personal 3-Pack is **$6,600**.

Substitutions and Cancellations

Circumstances may occur that could prevent you or your employee from attending a course for which you are enrolled. For this reason, we allow you to substitute another employee in their place at no additional fee. If no substitute student is available and you must cancel your enrollment, a refund will be issued by visiting www.jcitraininginstitute.com at least 10 business days prior to the start of the course. If, however, you must cancel within 10 business days of the start of the course, you will be liable for the entire course fee.

Johnson Controls reserves the right to cancel classes and assumes no liability for expenses. All registrants will be notified at least ten days before the start of class should a course be canceled.

Guarantee

We stand behind our courses with the following guarantee: If, by the midpoint of the course, you are not satisfied with the course you are taking, Johnson Controls Training Institute will refund your tuition fee in full, or give you credit toward another course or packaged training program.

TRAINING INSTITUTE LOCATIONS AND HOTELS

Students must call the hotels directly to make reservations. The Johnson Controls Training Institute rate must be requested. Be sure to ask about complimentary shuttle services to and from our learning centers. (These services are not available everywhere). Reservations made through a travel agency are not eligible for the discounted rate. Look for maps of the Training Institutes on the Johnson Controls website: **www.johnsoncontrols.com/institute**

Baltimore, Maryland

60 Loveton Circle, Sparks, MD 21152
Located in rural Baltimore County off of I-83 North, approximately 35 miles from Baltimore Washington International Airport.
Airport Code: BWI

Suggested Hotels

Embassy Suites
213 International Circle
Hunt Valley, MD 21030

Holiday Inn Express Hunt Valley
11200 York Road
Hunt Valley, MD 21030
410-527-1500

Residence Inn - Hunt Valley
45 Schilling Rd
Hunt Valley, MD 21031
410-527-2333

Greater Baltimore Convention and Visitor Bureau
www.baltimore.org
1-877-Baltimore

Boston, Massachusetts

39 Salem Street, Lynnfield, MA 01940
Located approximately 12 miles from Boston's Logan International Airport.
Airport Code: BOS

Suggested Hotels

Four Points by Sheraton Wakefield Boston Hotel and Conference Center
1 Audubon Road
Wakefield, MA 01880
781-245-9300

Hampton Inn
59 Newberry Street (Route1)
Peabody, Ma 01960
978-536-2020

SpringHill Suites by Marriott
43 Newberry Street (Route 1)
Peabody, Ma 01960
978-535-5000

Greater Boston Convention and Visitor's Bureau
www.bostonusa.com

The City Guide Salem, MA
www.salemweb.com

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Dallas, Texas

3021 West Bend Drive, Irving, TX 75063
Located 6 minutes from the Dallas Fort Worth International Airport.
Airport Code: DFW

Suggested Hotels

Element
3550 W. IH 635
Irving, TX 75063
972-929-9800

Staybridge Suites - DFW Airport North
2220 Market Place Blvd
Irving TX 75063
972-401-4700

Hyatt House Dallas/Las Colinas
5901 N MacArthur Blvd
Irving TX 75039
972-831-0909

Hilton Garden Inn Las Colinas
7516 Las Colinas Blvd
Irving TX 75063
972-444-8434

Greater Dallas Convention and Visitor Bureau
www.dallascvb.com
214-571-1000

Houston, Texas,

10644 West Little York Road,
Houston, TX 77041
Located approximately 22 miles from the George Bush Intercontinental Airport and 27 miles from Houston/Hobby Airport.
Airport Codes: IAH and HOU

Suggested Hotels

Candlewood Suites Houston – Pasadena
3450 East Sam Houston Pkwy S,
Pasadena, TX 77505
713-920-9927

Best Western Deer Park Inn & Suites
1401 Center St,
Deer Park, TX 77536
281-476-1900

Comfort Suites Deer Park Pasadena
1501 Center St,
Deer Park, TX 77536
281-930-8888

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Indianapolis, Indiana

1255 North Senate Avenue,
Indianapolis, IN 46202
Located approximately 15 minutes from the Indianapolis International Airport.
Airport Codes: IND

Suggested Hotels

Courtyard Marriott Indianapolis at the Capital
320 North Senate Ave
Indianapolis, IN 46204
317-684-7733

Hampton Inn Indianapolis Downtown
105 S Meridian St
Indianapolis, IN 46225
317-261-1200

Residence Inn Marriott Canal
350 West New York Street
Indianapolis, IN 46202
317-822-0840

Greater Indianapolis Convention and Visitor Bureau
www.visitindy.com

Louisville, Kentucky

9410 Bunsen Parkway, Suite 100,
Louisville, KY 40220
Located approximately 10 miles from Louisville International Airport.
Airport Codes: SDF

Suggested Hotels

Holiday Inn Louisville East – Hurstbourne
1325 South Hurstbourne Parkway
Louisville, KY 40220
502-426-2600

Hyatt Place – East
701 South Hurstbourne Parkway
Louisville, KY 40222
502-426-0119

Greater Louisville Convention and Visitor's Bureau
www.gotolouisville.com

TRAINING INSTITUTE LOCATIONS AND HOTELS

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Milwaukee, Wisconsin

514 N. Jefferson Street,
Milwaukee, WI 53202
Located in downtown Milwaukee, approximately 10 miles from General Mitchell International Airport.
Airport Codes: MKE

Suggested Hotels

Courtyard Marriott
300 West Michigan Street
Milwaukee, WI 53203
414-291-4122 / 888-811-8139

Hilton Garden Inn Milwaukee Downtown
611 N Broadway
Milwaukee, WI 53202
414-271-6611

Hilton – Milwaukee City Center
509 West Wisconsin Avenue
Milwaukee, WI 53203
414-271-7250 / 800-445-8667

Hotel InterContinental
139 East Kilbourn Avenue
Milwaukee, WI 53202
414-276-8686

Pfister Hotel
424 East Wisconsin Avenue
Milwaukee, WI 53202
414-273-8222 / 800-558-8222

Residence Inn Marriott
648 N. Plankinton Avenue
Milwaukee, WI 53203
414-224-7890

Greater Milwaukee Convention and Visitor Bureau
www.milwaukee.org
414-273-3950 / 800-554-1448

Phoenix, Arizona

Gateway Community College,
108 N. 40th Street, Phoenix, AZ 85034
Located about one mile north of the Phoenix Sky Harbor International Airport.
Airport Codes: PHX

Suggested Hotels

Crowne Plaza Phoenix
4300 East Washington Street
Phoenix, AZ 85034
602-273-7778

Hampton Inn
601 North 44th Street
Phoenix, AZ 85008
602-267-0606

Hilton Garden Inn
3838 East Van Buren Street
Phoenix, AZ 85008
602-306-2323

Greater Phoenix Convention and Visitor's Bureau
www.arizonaguide.com

TRAINING INSTITUTE LOCATIONS AND HOTELS

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Southern California

5770 Warland Drive, Cypress, CA 90630
Located approximately 9 miles from the Long Beach Airport, 20 miles from the John Wayne Airport, and 30 miles from the Los Angeles International Airport.
Airport Codes: SNA & LAX

Suggested Hotels

Ayres Hotel
12850 Seal Beach Boulevard
Seal Beach, CA 90740
800-653-3230

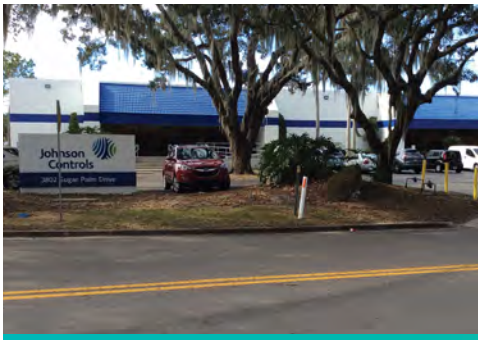
Courtyard Marriott
5865 Katella Avenue
Cypress, CA 90630
714-827-1010

Hyatt House
5905 Corporate Avenue
Cypress, CA 90630
714-828-4000

Marriott Residence Inn
4931 Katella Avenue
Los Alamitos, CA 90720
714-484-5700

Greater Los Angles Convention and Visitor Bureau
www.latourist.com
213-689-8822

Orange County Visitor Information
www.visittheoc.com
877-GO-ORANGE



Tampa, Florida

3802 Sugar Palm Dr, Tampa FL 33619
Located 12 miles from the Tampa International Airport.
Airport Codes: TPA

Suggested Hotels

Hilton Garden Inn Tampa East/Brandon
10309 Highland Manor Drive
Tampa, FL 33610
813-626-6700

Residence Inn Tampa Sabal Park/Brandon
9719 Princess Palm Avenue
Tampa, FL 33619
813-627-8855

Staybridge Suites Tampa East Brandon
3624 North Falkenburg
Tampa, FL 33619
813-227-4004

Fairfield by Marriott
6720 Lakeview Center Drive
Tampa, FL 33619
(813) 626-3000

Holiday Inn Express & Suites
8610 Elm Fair Blvd
Tampa, FL 33610
(813) 490-1000

Greater Tampa Convention and Visitor's Bureau
www.visittampabay.com

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New Freedom, PA

5000 Renaissance Drive
New Freedom, PA 17349
Located 52 miles from the Baltimore Washington International Airport and 47 miles from the Harrisburg International Airport.
Airport Codes: BWI & MDT

Suggested Hotels

Home2 Suites by Hilton York
212 Pauline Drive
York, PA 17402
717-747-0360

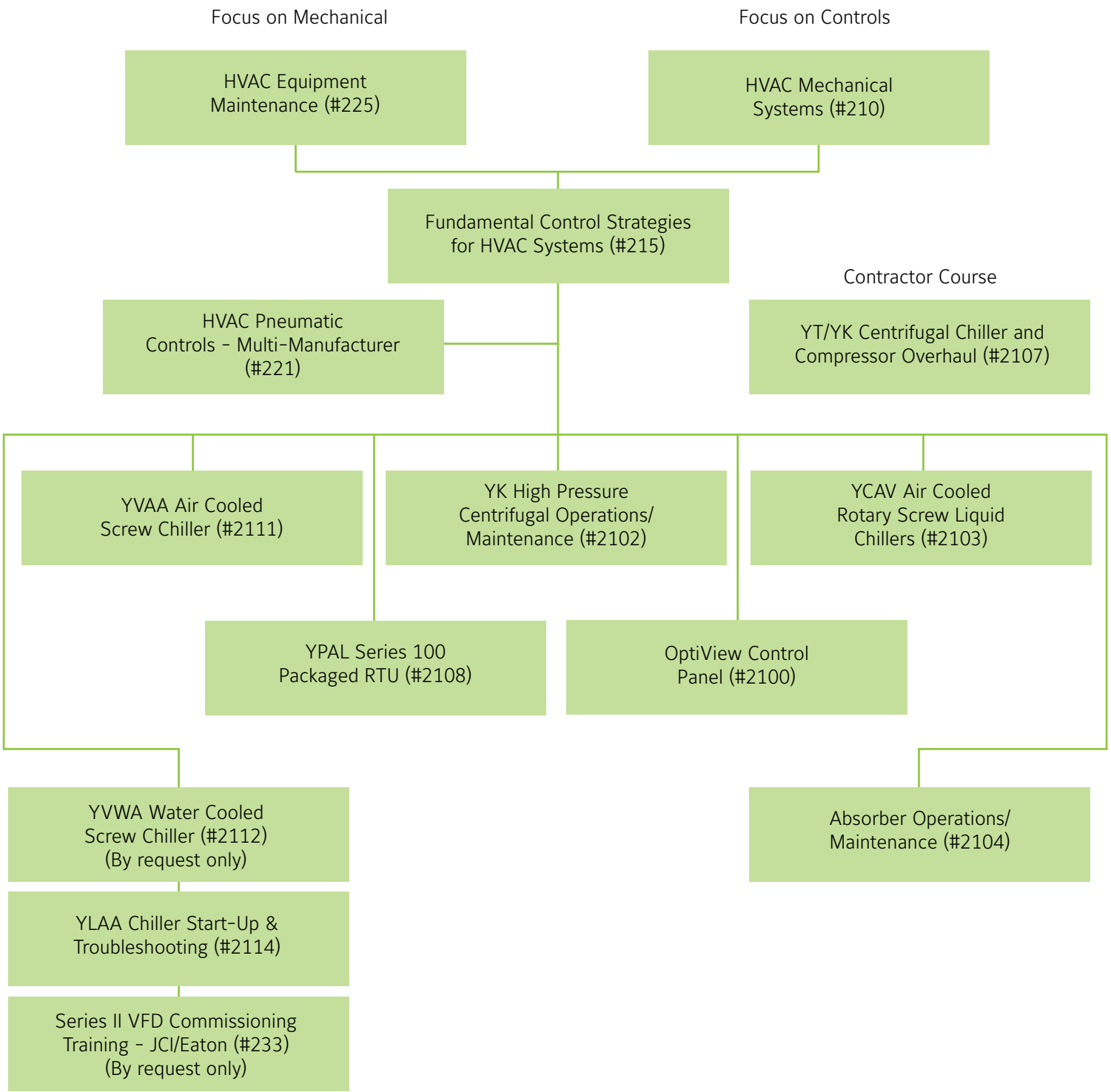
Shrewsbury Hampton by Hilton
1000 Far Hills Drive
New Freedom, PA 17349
717-235-9898

Holiday Inn Express & Suites York
140 Leader Heights Road
York PA 17403
717-741-1000

Hampton Inn & Suites Hilton York South
2159 South Queen Street
York PA 17402
717-741-0900

Greater Shrewsbury Convention and Visitor's Bureau
www.shrewsburyguide.info

TYPICAL SEQUENCE OF HVAC INDUSTRY COURSES



HVAC Mechanical Systems
Course #210, 3.0 CEU

Course Duration	Course Fee
Monday–Friday Class ends at 11:30 a.m. on Friday	$2300 per student

The fundamentals of HVAC mechanical equipment operation are taught in this survey, hands-on course. Designed for personnel responsible for the selection, design, installation, calibration or maintenance of HVAC mechanical equipment. It emphasizes hands-on activities with boilers, chillers, air handlers and other operating equipment from a variety of manufacturers. Students will gain a comprehensive understanding of operating principles and the proper use of test instruments to verify equipment performance.

ENROLL NOW

Course Topics

- HVAC System Types and Piping Systems
- Psychrometrics
- Air Handlers, Types and Characteristics
- Fans and Fan Characteristics
- Dampers and Damper Actuators
- Valves and Valve Actuators
- Facility Management Systems
- Controls and Components
- Boilers and Boiler-Related Equipment
- Heat Exchangers and Pumps
- Refrigeration Fundamentals
- Reciprocating Chillers and Accessories
- Centrifugal Chillers
- General Troubleshooting
- Hands on Lab
- Final Review

Fundamental Control Strategies for HVAC Systems
Course #215, 3.0 CEU

Course Duration	Course Fee
Monday–Friday Class ends at 11:30 a.m. on Friday	$2300 per student

This introductory course is designed for anyone who operates, maintains or troubleshoots HVAC control systems. Students will analyze a number of HVAC Systems and their associated controls, including central plant, air and water distribution and terminal systems. The strategies learned can be applied to any controls system type or manufacturer.

ENROLL NOW

Course Topics

- HVAC Environment, Systems and Controls
- Psychrometrics, Air Properties and HVAC Processes
- Control System Fundamentals
- Sensor Types and Applications
- Controls System Configurations
- Feedforward and Feedback Control Loops
- Reset Control Strategies
- Controlled Devices: Valves, Dampers,and Actuators
- Hot/Chilled Water Distribution Systems
- Control Strategies for Water Distribution Systems
- Hot/Chilled Water Terminal Systems
- Control Strategies for Water Terminal Systems
- Air Distribution Systems
- Control Strategies for Air Distribution Systems
- 100% OA System Control Strategies
- Mixed Air System Control Strategies
- Variable Air Volume Control Strategies
- VAV Terminal Unit Control Strategies
- Introduction to Facility Management Systems
- Hands on Lab
- Final Review

HVAC Pneumatic Controls - Multi Manufacturer
Course #221, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

This course provides a comprehensive overview of maintenance requirements, calibration procedures and troubleshooting techniques. Hands-on lab exercises emphasize calibrating and troubleshooting using pneumatic controls from a variety of manufacturers.

ENROLL NOW

Recommended Prerequisite:

Fundamental Control Strategies for HVAC Systems (#215) or HVAC Mechanical Systems (#210) or equivalent experience

Course Topics

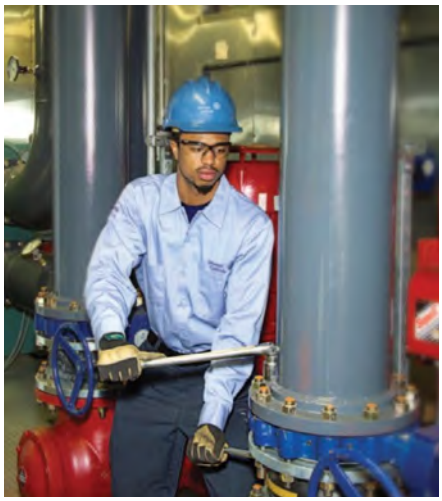
- Pneumatic Air Supply and Distribution Systems
- Room Control – Thermostats and Humidistats
- Relation of Controller and Controlled Device
- Single Setpoint Room Controllers, Thermostats and Humidistats
- Dual Setpoint Room Controllers
- Pneumatic Controlled Devices: Valves, Dampers, Actuators, Pilot, Positioners
- Auxiliary Devices
- Pneumatic Transmitters (Remote Sensing)
- Single Input Receiver Controllers
- Dual Input Receiver Controllers

HVAC Equipment Maintenance
Course #225, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

This introductory course provides an overview of the maintenance tasks and techniques that are typically required on HVAC equipment. Individuals new to HVAC maintenance, managing a maintenance function or desiring a refresher will benefit. Students will learn how to perform proper maintenance, safety procedures and basic troubleshooting techniques.

ENROLL NOW



Course Topics

- Overview of HVAC
- Electrical Systems
- OSHA Lockout/Tagout Training
- Refrigeration Maintenance and Troubleshooting
- Centrifugal Systems Overview
- Pump Maintenance
- Cooling Towers
- Air Handling Systems
- Boilers
- Air Compressor Maintenance
- Hands on Lab
- Final Review

OptiView Control Panel
Course #2100, 1.3 CEU

Course Duration	Course Fee
Tuesday-Wednesday Class ends at 3:30 p.m. on Wednesday	$1400 per student

This two-day course for service personnel covers the OptiView graphic micro-processor control center. Basic navigation, panel architecture, operation and service of the OptiView Control Centers are covered in this course. Labs include hands-on training using OptiView Control Panel simulators.

ENROLL NOW

Course Topics

- OptiView Basics
- OptiView Architecture: Component Identification, Location and Functionality
- OptiView Operation: Screen Navigation,Program Download, Codes, Configuration Setup, System Commissioning Checklist
- System Calibration, Service Setpoints and Reset Procedures
- Electro-Mechanical Starter Board
- Solid State Starter Board
- Variable Speed Drive Board
- High Speed Thrust Bearing Limit Switch
- Proximity Probe, Refrigerant Level Control
- Sale Order Data, Custom User ID and Password, Record Setpoint Changes
- High Condenser Pressure Warning Threshold
- Smart Freeze Protection
- Diagnostics and Troubleshooting
- Advanced Diagnostics, Trend Screen Setup
- Hands on Lab

YK High Pressure Centrifugal Operations/Maintenance
Course #2102, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

Students will learn about the internal workings of the YK high-pressure centrifugal single-stage compressor, oil return system, OptiView Control Center and other components and subsystems. A comprehensive review of the preventive maintenance schedule and system capacity checkout procedure is also covered.

ENROLL NOW

Course Topics

- Centrifugal Compressor Theory of Operation
- YK Chiller Design and Component Functionality
- YK Seasonal Start-up
- OptiView Basics: Application, Terminology
- OptiView Architecture: Component Identification, Component Location
- OptiView Operation: Screen Navigation, Interpretation, and Modification
- Maintenance
- Troubleshooting
- Warranty
- OptiView Simulator Hands on Lab
- Evaluating Chiller Performance

YCAV Air Cooled Rotary Screw Liquid Chillers*
Course #2103, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

This three-day course teaches service personnel about the YCAV Chiller features, including the screw compressor, system ancillary components, unit operation and maintenance. *Dress code: For safety, closed-toe, leather shoes and long pants are required.

ENROLL NOW

Course Topics

- Screw Chiller Basics
- Basic Electronics
- VSD Basics
- VSD and Control Panel Architecture
- Operation and Sequencing
- Latitude Simulator Exercises
- Information and Safety, Handling and Storage
- VSD Operation and Faults
- Maintenance
- Unit Troubleshooting
- Hands on Lab

Absorber Operations/Maintenance
Course #2104, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

This course teaches operators and technicians about the operation and controls associated with the YORK® lithium bromide absorption chillers. Absorption theory including P/T relationships and solution chemistry are also covered. The operation and operating procedures for both Isoflow (single stage) and Paraflow systems (two stage) are reviewed with an emphasis on preventive maintenance procedures.

ENROLL NOW

Course Topics

- Basic Refrigeration Principles
- Units of Measure, Types of Heat
- Absorption Principles
- Solution Chemistry
- YIA Components and Cycle
- Water Circuits
- YPC Components and Cycle
- YPC Purge System
- Operating Information, Setpoints and Warnings
- System and Safety Cycling Shutdowns
- Operation and Maintenance
- Crystallization
- Unit Operation and Operational Limitations
- Refrigerant Contamination
- Heating/Cooling Changeover
- Preventive Maintenance
- Schedules
- Hands on Lab

YT/YK Centrifugal Chiller and Compressor Overhaul*
Course #2107, 3.3 CEU

Course Duration	Course Fee
Monday-Friday Class ends at 3:30 p.m. on Friday	$2700 per student

Service personnel will become familiar with the operation and maintenance of centrifugal systems. Students will review R-11, R-123, R-22 and R-134a single stage centrifugal chillers. They will also learn the internal workings of the compressor, oil return system, lube circuit, purge and heat exchangers. The OptiView Control Center plus preventive maintenance and system checkout procedures are also addressed along with a hands-on teardown and rebuild of a YK centrifugal compressor. *Dress code: For safety, closed-toe, leather shoes and long pants are required.

ENROLL NOW

Course Topics

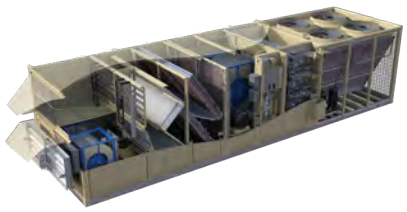
- Refrigeration Theory
- Centrifugal Compressor Theory of Operation
- YT/YK Chiller Design and Component Functionality
- YT/YK Maintenance
- Seasonal Start-up
- Unit Troubleshooting
- Compressor Teardown/Reassembly
- OptiView Basics
- OptiView Operation
- OptiView Start-up and Troubleshooting
- High Speed Thrust Switch
- Proximity Probe
- Refrigerant Level Control
- Oil Pump Variable Speed Drive
- Hands on OptiView Labs

YPAL Series 100 Packaged RTU
Course #2108, 1.3 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

Students will learn the theory of operation of the Constant Volume and Variable Volume Eco2 Rooftop Unit. Component functions, subsystems are also discussed, along with an introduction to the FlexSys Systems. The students will become familiar with the unit's wiring and communication cards, and the programming and sequence operation.

ENROLL NOW



Recommended Prerequisite:
Entry to Mid- level Technician

Course Topics

- Safety Review
- Eco2 System Overview
- Constant Volume/Variable Volume Systems
- Eco2 Physical Data
- Unit Wiring
- Introduction to FlexSys System
- BAS Communication
- IPU Architecture
- Unit Configuration and Start-up
- Programming and Sequence of Operation

YVAA Air Cooled Screw Chiller*

Course #2111, 1.3 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

This three-day course teaches experienced service technicians about the YVAA Chiller. The course will include features of this unit and the differences in installation, operation and maintenance from the YCAV. *Dress code: For safety, closed-toe, leather shoes and long pants are required.

ENROLL NOW

Recommended Prerequisites:
- Working knowledge of the YCAV/YCIV Chiller
- Working knowledge of VSDs
- Understanding of basic electronics

Course Topics

- Chiller layout and components
- Safety, handling
- Installation
- Operation/Maintenance
- VSD
- Simulation Exercises

YLAA Chiller Start-up & Troubleshoot

Course #2114, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

Students will learn the techniques, strategies and skills required to operate, repair, start-up and maintain York® YLAA chiller and YLPA heat pump/chillers using multiple scroll compressors in each system. The techniques acquired in this course may be applied to other York® small tonnage chillers and condensing units such as YCAL, YLUA and YCUL models.

ENROLL NOW

Course Topics

- Safety
- Literature
- Theory
- Components
- Operations
- Wiring Diagrams
- Installation
- Startup
- Maintenance
- Evaluating Performance
- Warranty

TYPICAL SEQUENCE OF COURSES FOR METASYS® SYSTEMS

Metasys® system extended architecture for Building Operators (#388)

OR

Metasys® system extended architecture for Building Engineers (#389)

Focus on Maintenance and Troubleshooting

- Fundamental Control Strategies for HVAC Systems (#215)
- Introduction to Metasys® N2 Controllers (#4601)
- Metasys DX-9100 Operations/ Troubleshooting (#365)
- Metasys® FEC Operations/ Troubleshooting (#4703)
- Metasys® extended architecture Hardware and Troubleshooting (#4718)

Focus on Engineering and Programming

- Fundamental Control Strategies for HVAC Systems (#215)
- Introduction to Metasys® N2 Controllers (#4601)
- Metasys DX9100 Engineering (#364)
- Metasys® FEC Systems Engineering (#4707)
- Metasys® System Extended Architecture Engineering and Setup (#391)
- Metasys® System Extended Architecture Advanced Engineering (#397)
- Metasys® Graphics Generation Tool (#3002) (See Distance Learning)

Note: Your facility may utilize ASC controllers, DX, FEC controllers, or a combination of any of these products. Make certain to select the appropriate courses based on your facility.

Introduction to Metasys User Interface (#3021) (See Distance Learning)

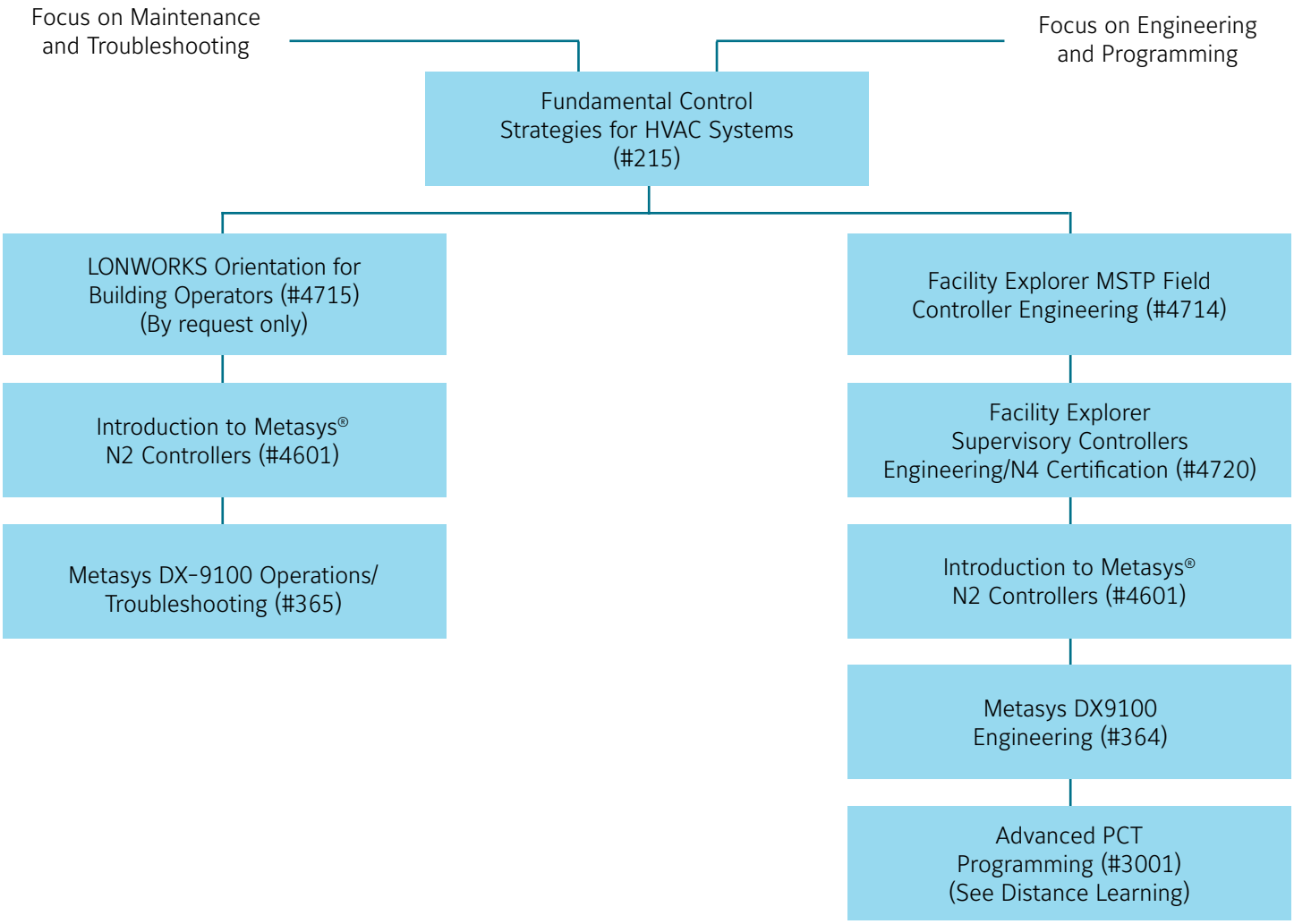
Engineering and Programming

Metasys User Interface Graphics Editor (#3022) (See Distance Learning)

Eaton VSD Commissioning Certification (#232) (By request only)

Series II VFD Commissioning Certification - JCI/Eaton (#233) (By request only)

TYPICAL SEQUENCE OF COURSES FOR FACILITY EXPLORER®



Note: Your facility may include a variety of Metasys® and Facility Explorer equipment, making it appropriate for you to choose courses from this flowchart and from others in this section.

TYPICAL SEQUENCE OF COURSES FOR METASYS® VALIDATED ENVIRONMENTS

Engineers

- Fundamental Control Strategies for HVAC Systems (#215)
- Metasys® FEC Systems Engineering (#4707)
- Introduction to Metasys® N2 Controllers (#4601)
- Metasys DX9100 Engineering (#364)
- Metasys® System Extended Architecture Advanced Engineering (#397)
- Metasys® FEC Custom Programming (#4704)

Designers

- Metasys® System Extended Architecture Engineering and Setup (#391)
- Metasys® Graphics Generation Tool (#3002) (See Distance Learning)

Note: Your facility may include a variety of Metasys® and Facility Explorer equipment, making it appropriate for you to choose courses from this flowchart and from others in this section.

Introduction to Metasys® N2 Controllers
Course #4601, 2.7 CEU

Course Duration	Course Fee
Tuesday-Friday Class ends at 11:30 a.m. on last day	$2300 per student

Introduction to the hardware, software, and tool components of the Metasys® N2 family of controllers. Learn how the hardware interconnects, the protocol used for communication, and the software and hardware tools used to operate and maintain N2 ASC and DX-9100 devices. ASC controllers include VAV, VMA, UNT, and AHU.

Recommended Prerequisite:
Fundamental Control Strategies for HVAC Systems (#215) or equivalent experience

Course Topics

ENROLL NOW

- Identify ASC and DX-9100 controllers and components
- Correctly use the software tools associated with N2 controllers
- Transfer files in N2 controllers
- Commission and tune N2 controllers
- Describe PRAC operation
- Operate the DX-9100 front panel
- Calibrate sensors used with N2 controllers
- Hands-on Lab

Metasys® DX-9100 Engineering
Course #364, 3.0 CEU

Course Duration	Course Fee
Monday-Friday Class ends at 11:30 a.m. on Friday	$2300 per student

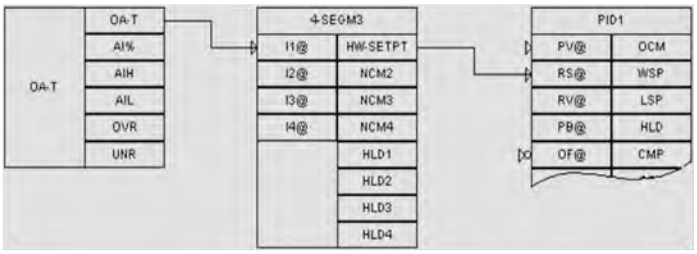
Experienced DX-9100 users will learn how to create and modify the DX-9100 application programs using Windows-based GX-9100 software. This course is a follow-up to the Metasys® DX-9100 Operations/Troubleshooting course for students who want to develop their skills in programming and troubleshooting their DX-9100 system.

Recommended Prerequisites:
Fundamental Control Strategies for HVAC Systems (#215) and any Metasys® DX-9100 Operations/Troubleshooting (#365) and or field experience of DX front panel.

Course Topics

ENROLL NOW

- Introduction to the DX-9100 System
- Front Panel Operation
- DX Commissioning Tool
- Creating an Application Using GX-9100 Software
- Input Point Configuration
- Output Point Configuration
- Expansion Point Configuration
- Control Modules
- Numeric Modules
- Programmable Logic Controller
- Using Library Functions
- Student Topic Selected Lab
- Hands on Lab
- Final Review



Metasys® DX-9100 Operations/Troubleshooting Course #365, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

This introductory course teaches participants how to communicate and troubleshoot effectively using the DX-9100. This course is highly recommended for anyone involved in the day-to-day operation of a DX-9100 system.

Course Topics

ENROLL NOW

- Overview of the DX-9100 Controller
- Extension and Expansion Modules
- Front Panel Operation – Viewing Inputs/Outputs
- Time, Constants, PM Data, Schedules
- Front Panel Operation – Changing PM Data
- Constants, Auto/Manual Mode
- Introduction to the GX-9100 Program
- Commissioning Mode, Calibration
- Basic System Troubleshooting Using the DX-9100
- Loop Diagnosis Using Data Graphing
- Hands on Lab
- Final Review

Metasys® FEC Operations/Troubleshooting Course #4703, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

Designed as a beginners course for people working with Field Equipment Controllers (FECs), this course shows students how to connect to FECs and how to download and test existing control programs. It also covers calibration of input sensors and setup and verification of inputs and outputs. This course is designed for building personnel who want to better understand field controller operation, commissioning and troubleshooting.

Recommended Prerequisite:
Fundamental Control Strategies for HVAC Systems (#215) or equivalent experience

Course Topics

ENROLL NOW

- Introduction to Controllers
- CCT User Interface
- Mobile Access Portal
- Transferring Files
- Data Flow and Connections
- IO Commissioning
- Peer-to-Peer
- PRAC+ and PID
- Commissioning Programs
- Simulating Programs
- Hands-on Labs
- Final Review

Metasys® FEC Systems Engineering
Course #4707, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

In this advanced Field Equipment Controller (FECs) programming class, students will learn how to write and test programs for the (FECs). They will use the software simulation tool to verify that the programs satisfy the sequence of operations. The course is designed for experienced personnel who want to become proficient in writing or revising programs for Johnson Controls FEC devices. Although not a prerequisite, it is highly recommended that students are familiar of the topics found in course #4703.

Recommended Prerequisite:
Fundamental Control Strategies for HVAC Systems (#215) or equivalent experience

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.

Course Topics

ENROLL NOW

- CCT User Interface
- Application Creation
- Setting Preferences
- Configuring a Local Display
- Peer-to-Peer
- Sideloops
- Advanced Application Controllers
- State Tables
- Data Flow and Connections
- Logic Blocks
- Adding Modules
- PRAC+ and PID
- Troubleshooting an Application
- Hands-on Labs
- Final Review

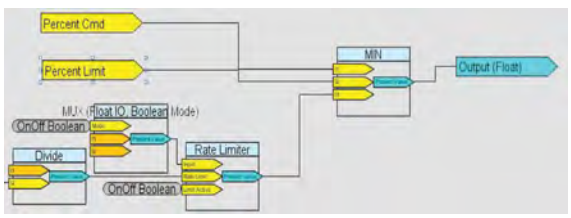
Metasys® FEC Custom Programming
Course #4704, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

Students will learn how to create and test customized control strategies for FEC controllers in this three-day course. The course is designed for experienced building personnel who want to expand their knowledge of HVAC Control Systems and Johnson Controls FEC devices.

Recommended Prerequisites:
Metasys® FEC Systems Engineering (#4707) and experience using the FEC software prior to attending 4704

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.



Course Topics

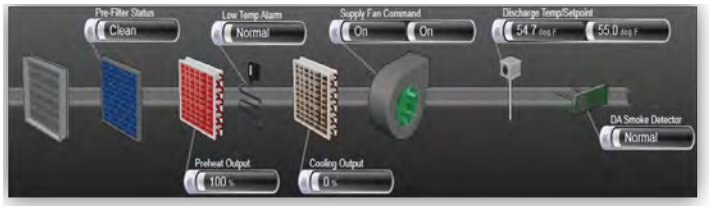
ENROLL NOW

- CCT User Interface
- Adding and Modifying Modules
- Logic Blocks
- File and Module Management
- PRAC+ and PID
- State Tables
- Sequencers
- Central Plant Application
- Hands-on Labs

Metasys® System Extended Architecture for Building Operators Course #388, 2.0 CEU

Course Duration	Course Fee
Monday-Wednesday Class ends at 3:30 p.m. on Wednesday	$1800 per student

This three-day course teaches building personnel how to make the most effective and efficient use of the features of a Metasys® system extended architecture building management system. This course is for building personnel who have new installations of Metasys® system extended architecture using NAEs or NIEs or for those who have migrated from their existing Metasys® system.



Course Topics

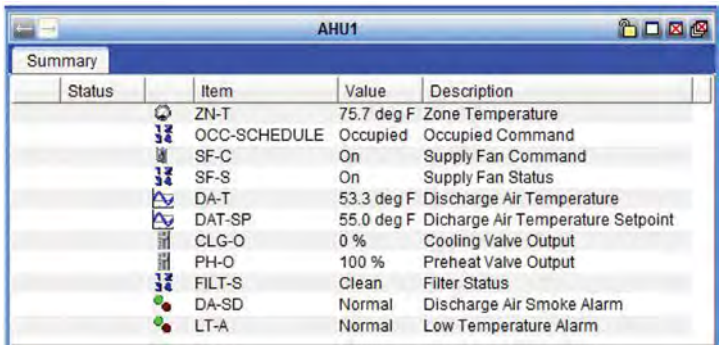
ENROLL NOW

- Metasys® System Extended Architecture Overview
- Help File System
- Basic Navigation of the System with the User Interface
- Commanding Objects
- Scheduling
- Setting Up Alarms
- Responding to Alarms
- Trending
- Totalization
- Graphics
- Hands on Lab
- Final Review

Metasys® System Extended Architecture for Building Engineers Course #389, 3.0 CEU

Course Duration	Course Fee
Monday-Friday Class ends at 11:30 a.m. on Friday	$2300 per student

This course teaches building personnel how to make the most effective and efficient use of the features of a Metasys® system extended architecture building management system. This course contains additional topics not covered in the Metasys® system extended architecture for Building Operators course.



Course Topics

ENROLL NOW

- Metasys® System Extended Architecture Overview
- Help File System
- Basic Navigation of the System with the User Interface
- Commanding Objects
- Scheduling
- Setting Up Alarms
- Responding to Alarms
- Trending
- Totalization
- Graphics
- Setting Up Passwords
- User Views
- Audit Trails
- Sending Reports to Printers, Pagers, Emails, etc.
- Adding Inputs and Outputs to a Controller
- Reviewing Control Strategies
- Backing Up the Data
- Hands on Lab
- Final Review

Metasys® System Extended Architecture Engineering and Setup Course #391, 3.0 CEU

Course Duration	Course Fee
Monday-Friday Class ends at 11:30 a.m. on Friday	$2300 per student

Students will learn how to set up and manage the Network Automation Engine (NAE) database and to use the power of the System Configuration Tool to generate an NAE database from existing ASC controller programming.

Recommended Prerequisites:
Due to the material covered in the class, anyone wanting to enroll in this class is required to have had attended courses (#389) and (#4707) or (#353).

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.

Course Topics

ENROLL NOW

- Course Introduction
- System Overview and Comparisons
- NAE User Interface Overview
- System Configuration Tool Overview
- Adding BACnet® Devices
- Newest Feature Objects
- Overview: Designing a New Archive Database
- Installing Patches
- NIE and Migration Options Overview
- Hands on Lab
- Final Review

Metasys® System Extended Architecture Hardware and Troubleshooting Course #4718, 3.0 CEU

Course Duration	Course Fee
Monday-Friday Class ends at 11:30 a.m. on Friday	$2300 per student

This hands-on course provides experienced Metasys® users with valuable diagnostic and troubleshooting skills on system hardware. Discussions and exercises cover the full range of Metasys® Network products, with an emphasis on communication solutions and other commonly experienced problems.

Required Prerequisites:
Due to the material covered in the class, anyone wanting to enroll in this class is required to have had attended courses #389 and #4707 or #353.

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.

Course Topics

ENROLL NOW

- Metasys® extended architecture Review
- Network Architecture
  - Ethernet Level Connections (BACnet® over IP)
  - Controller Trunk Level Connections (BACnet®/MSTP, N2, and LON)
  - SA Bus Review
- Network Automation Engines, Network Integration
- Engines and Network Controller Engines Including:
  - NAE common hardware platform
  - NAE Diagnostics, how to run them and evaluate them.
- Introduction to the SCT Tool
- Short Review FEC Controller Family; FECs, VMAs and IOM Modules, and TEC Controllers
- Calibrating Sensors and Actuators and Applying Metering Devices
- Downloading Controllers
- Metasys® System Extended Architecture Database overview and organization best practices
- ADS/ADX Servers – their role and features in Metasys® and best practices for backup of data files

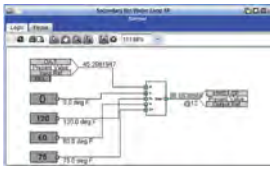
Metasys® System Extended Architecture Advanced Engineering Course #397, 2.0 CEU

Course Duration	Course Fee
Tuesday-Thursday Class ends at 3:30 p.m. on Thursday	$1800 per student

Experienced personnel will learn how to write advanced programs for facility-wide or specific mechanical control applications using the System Configuration Tool (SCT). Students will build, modify and troubleshoot routines they create.

Recommended Prerequisites:
Student must have background in operating and/or engineering the Metasys® system extended architecture. Metasys® system extended architecture Engineering and Setup (#391) or Metasys® system extended architecture for Building Engineers (#389).

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.



Course Topics

ENROLL NOW

- Review Metasys® system extended architecture
- Control Objects (Interlocks, Multiple Commands, LCT, etc.)
- Reset Strategies
- Sequencing Equipment
- Rotation of Equipment
- Operating Equipment per Load Needs
- Lead Lag Strategies
- Creating Calculations Including Tonnage, Highest Daily, Temperature, etc.
- Student Directed Topics and Activities
- Hands on Lab
- Final Review

Facility Explorer MSTP Field Controller Engineering Course #4714, 3.0 CEU

Course Duration	Course Fee
Monday-Friday Class ends at 11:30 a.m. on Friday	$2300 per student

Participants will receive an overview of the Facility Explorer MSTP field controller system, create programs from standard tree systems using the Programmable Controller and Commissioning tool, then connect to Bluetooth® and Zigbee® connections and download code into the controllers after setting up the hardware and software to communicate properly.

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.

Course Topics

ENROLL NOW

- Introduction To The Facility Explorer MSTP Field Controllers System
- Creating Applications Using The Standards Tree
- Establish Peer To Peer Communications
- Using Bluetooth® To Connect To Controllers
- Downloading And Uploading Controllers
- Commissioning Inputs And Outputs
- Commissioning State Based Strategies
- Implementing Zigbee® Wireless Communications
- Making Custom Changes To Controllers
- Programming Blocks
- Analyzing PID Loops And Hybrid Activities
- Configuring Sequencers And Multistage Controllers
- Troubleshooting Network Systems

Facility Explorer (FX) Supervisory Controllers Engineering/N4 Certification
Course #4720, 3.4 CEU

Course Duration	Course Fee
Monday-Friday Testing will end at 5:00 p.m. on Friday	**$3200 per student**

Basic instruction on design, engineer and program projects using FXWorkbench Pro running on Niagara 4. Testing for Niagara 4 Technical Certification Program (TCP) taken at end of the course.

Recommended Prerequisites:
Students must have a strong knowledge of Johnson Controls field controllers. A familiarization of building automation systems (BAS) would also be beneficial.

For End Users and/or Authorized Building Control Specialists/ Contractors only.

Note: Early payment discount does NOT apply. If a student scores between 50% – 69% on their certification exam they may retake the certification exam for $1000.00. This exam will be emailed and once the practical is completed, arrangements must be made by the student to get their database back to their test proctor to be graded. No exceptions will be made for any score below 50%

Course Topics

ENROLL NOW

- Course Introduction and System Overview
- Supervisory Controller User Interface Overview
- FXWorkbench Pro Overview
- Creating a Station
- Adding N2 and BACNet® MSTP Controllers and Points
- Extension Manager and Extensions
- Control Logic
- Tagging Objects
- Scheduling
- Defining Users and Roles
- Customizing Access Permissions
- Setting up Email Notification of Alarms
- Graphics
- Controller Summary
- Hierarchy Services
- Commissioning and Backing up a Station
- Auto discovering BACNet® points
- Using Standard Graphics for Other Devices
- Enterprise Connectivity
- Technical Certification Program (TCP) Examination

INSTRUCTOR-LED DISTANCE LEARNING COURSES

Johnson Controls

Advanced PCT Programming Course #3001

Course Duration	Course Fee
3 Days	$1200 per student

Students will learn how to create and test customized control strategies for General Purpose Programmable Controllers (PCG) controllers in this three-day online course. The course is designed for experienced building personnel who want to expand their knowledge of HVAC Control Systems and Johnson Controls PCG devices.

Recommended Prerequisites:
Facility Explorer MSTP Field Controller Engineering (#4714) and PCG/PCV/PCX controller programming experience. Students will need phone and a computer with high speed internet access to participate in the course.

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.

Course Topics

ENROLL NOW

- Central Plant Application in Programmable Controller Tool (PCT)
- Modules and Blocks in PCT
- Activities as Containers
- Hybrid Activities
- Proportional plus Integral plus Derivative (PID) and PID Pre-Processor
- State Tables
- Global Sequencer and Multi-stage Controller
- Pattern Recognition Adaptive Control (PRAC+) and Pulse Modulation Adaptive Control (PMAC)
- Review of Custom Lab
- Hands on Lab
- Final Review

Metasys® Graphics Generation Tool Course #3002

Course Duration	Course Fee
3 Days	$1200 per student

This course teaches students how to create and modify the custom graphics used to both monitor and actively change building parameters and settings in a Metasys® automation system. It is a three-day online internet course which combines active instructor facilitation with student practice sessions with the facilitator available for questions. This course is for individuals interested in creating and editing Graphics+Metasys® graphic files using Graphics Generation Tool (GGT) software.

Recommended Prerequisites:
Metasys® system extended architecture for Building Engineers (#389) OR Metasys® system extended architecture Engineering and Setup (#391). Students will need phone and high speed internet access to participate in the course.

For End Users and/or Authorized Building Controls Specialists/ Contractors Only.

Course Topics

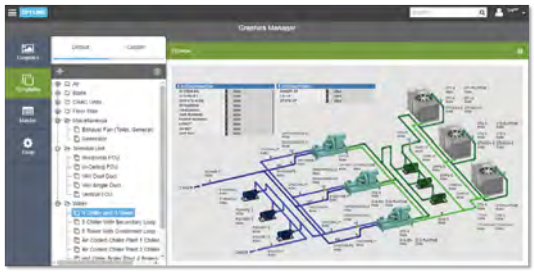
ENROLL NOW

- Provide an overview of the Graphics + tool with its features and terminology.
- Introduce the "Style Guide."
- Familiarize the student with how to commission graphics.
- Familiarize the student with how to create new graphics using the Graphic Generation Tool.
- Provide an opportunity for hands-on practice implementing key Graphics+tasks.

Introduction to Metasys® User Interface
Course #3021

Course Duration	Course Fee
8 Hours	$600 per student

This course is designed for customers who need to learn how to perform daily tasks using the Metasys® User Interface. After completing this course, participants will be able to navigate through the Metasys® UI to find the information that is relevant to your building. You will be able to complete daily tasks using the interface by focusing on issues that are critical to your site and take action on potential problems, leveraging advanced reporting capabilities for building analysis.



Course Topics

ENROLL NOW

- Navigate the New User Interface
- Understand the differences of the Space Dashboard and Equipment Dashboard
- Selecting widgets
- Using the Alarm Manager
- Issuing commands
- Search for and report on Metasys® data using Advanced Search
- Understand how the User Interface may be customized at your site
- Finding additional resources

Metasys® User Interface Graphics Editor
Course #3022

Course Duration	Course Fee
8 Hours	$600 per student

This course is designed for customers who have experience with the Metasys® User Interface, but want or need to learn how to create Metasys® UI Graphics. After completing this course, participants will be able to navigate the Metasys® Graphics Manager, import and export graphics and associate a graphics to a space, equipment definition, or piece of equipment and add custom behaviors to a graphic.

Course Topics

ENROLL NOW

- Access the Graphics Manager through the User Online/Offline
- Navigate the Graphics Manager
- Import and export graphics using the Offline User Interface
- Navigate through the Graphics Editor
- Create and edit the Master Layer for a site
- Create, edit, and associate a graphic to a space or piece of equipment
- Create and edit a floorplan
- Create and edit user defined graphics templates
- Add custom behaviors to graphics

COURSES OFFERED BY REQUEST ONLY

Johnson Controls

COURSES OFFERED BY REQUEST ONLY

The following courses are only available at your request. They can usually be conducted at your site or at one of our Training Institute locations with a minimum of eight students.

These courses are not included in the Learning Catalog schedule at the back of this publication. For more information about the content, availability and pricing of these courses, call the Training Institute Registrar at 800-524-8540 or 414-524-4286 or email at **cg-customer.registrar@jci.com**.

YVWA Water Cooled Screw Chiller*
Course #2112, 1.3 CEU

This two-day course teaches experienced service technicians about the YVWA Chiller. The course will include features of this unit and the differences in installation, operation and maintenance from the YCAV. *Dress code: For safety, closed-toe, leather shoes and long pants are required.

Recommended Prerequisites:

- Working knowledge of the YCAV/YCIV Chiller
- Working knowledge of VSDs
- Understanding of basic electronics

Course Topics

- Product Description
- Innovative Technology
- VSD Components and VSD Cooling Circuit
- VSD Operation and Faults
- Chiller Faults and Troubleshooting
- Chiller Maintenance

COURSES OFFERED BY REQUEST ONLY

Eaton VSD Commissioning Certification Training
Course #232, 1.3 CEU

This course provides factory authorized certification of personnel responsible for commissioning the Johnson Controls VSD series product line. The first half of the instruction provides a high level of technical detail related to the setup and operation of the VSD series drive. The second half provides technical detail on how to diagnose and repair VFDs in general. Certified startup provides a 3rd year VFD warranty extension at no additional charge. Students will receive a training certificate upon course completion.

Series II VFD Commissioning Certification Training - JCI/Eaton
Course #233, 0.7 CEU

This 1 day class is taught by an Eaton representative and provides factory authorized certification of personnel responsible for commissioning the Johnson Controls VSD series II product line. The first half of the instruction provides a high level of technical detail related to the setup and operation of the VSD series drive. The second half provides technical detail on how to diagnose and repair VFD's in general. Certified startups provide a 3rd year VFD warranty extension at no additional charge. Students will receive a training certificate upon course completion and you must be present for all days of class and pass a knowledge test to receive your training certificate.

Prerequisites:
Each student will be required to provide their own laptop, Internet patch cable ** and a digital multi-meter.

Metasys® HVAC ASC Engineering
Course #353, 3.0 CEU

This course covers programming and testing control strategies for Application Specific Controllers (ASCs). The course is designed for experienced building personnel who want to expand their knowledge of HVAC Control Systems and Johnson Controls ASC devices.

Recommended Prerequisites:
Fundamental Control Strategies for HVAC Systems (#215) or equivalent experience.

Metasys® HVAC ASC Operations/Troubleshooting
Course #381, 3.0 CEU

Students will learn about the Application Specific Controllers (ASC) used at their facility. Extensive hands-on lab activities use HVACPRO software to work with AHU, UNT, VAV and VMA controllers for troubleshooting programs and field devices.

Recommended Prerequisite:
Fundamental Control Strategies for HVAC Systems (#215) or equivalent experience.

LEARNING PACKAGES

Johnson Controls

LEARNING PACKAGES

Learn what you need, when you need it with Johnson Controls Training Institute Learning Packages. Learning packages are a way to prepare for an instructor-led course or to review material you may not use everyday. While some packages are generic in content, all are oriented toward Johnson Controls equipment to provide additional assistance and information in using our products.

Written Material

Sometimes we need to "see it on paper" in order to believe it. Our workbooks contain hands-on lab activities for you to complete using your own equipment, in your own facility.

To Order Call

Quantity, site and educational discounts are available for most packages. Call 800-524-8540 for details.

HVAC Controls Manual (P2074)

This handy reference provides a clear, concise explanation of the application of pneumatic controls to HVAC systems. (©1987 Johnson Controls, Inc.)

Price: $50.00

Topic Outline:

- Basic Control Concepts, Fan Systems
- Pneumatic Power Supplies, Pneumatic Relays
- Room Thermostats and Humidistats
- Valves and Actuators
- Dampers, Actuators and Positioners
- Auxiliary Devices, Dual Setpoint Thermostats
- Pneumatic Transmission, Master/Submaster

Building Environments: HVAC Systems (P99)

This comprehensive, easy-to-read text builds your understanding 1of HVAC systems and the controls that manage them. (©1997 Johnson Controls, Inc.)

Price: $99.00

Topic Outline:

- HVAC Systems and Facility Management
- Heat, Temperature and Pressure Basics
- Managing Human Comfort
- Determining Loads on an HVAC System
- Psychrometrics, HVAC System Types
- Heat Exchange and Recovery Equipment
- Refrigeration Cycle and Equipment
- Centrifugal Pumps and Hydronic Systems
- Air Cleaning Equipment, Fans, Ducts, Humidifiers
- Control Strategies for Occupant Comfort
- Advanced Technology for Effective Facility Control

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Milwaukee, WI 53202

Questions about your order? Call Learning Services at 800-524-8540.
(Please print additional copies of this form, if necessary, for further reference or use.)

FACILITY O&M WORKFORCE ASSESSMENTS AND DEVELOPMENT SOLUTIONS

With Facility Operation & Maintenance (O&M) budgets continuing to shrink, why waste limited training dollars on courses your workforce may not need? The Johnson Controls Training Institute can maximize your training investments by assessing your Facility O&M Staff Skills and working with your teams to identify the best development solutions to meet your facility performance goals.

The Johnson Controls Training Institute has more than 60 years of success developing people to operate and maintain buildings. We assist large and small workforces in hospitals, education facilities, pharmaceutical companies, office buildings, utility companies, and government facilities.

Our services are customized for your needs and typically include the steps below:

STEP 1: Review Facility Strategies and Desired Outcomes
STEP 2: Complete Site-specific Skill Assessments by Job Roles
STEP 3: Analyze Root Causes of Staff Performance Gaps
STEP 4: Design and Deploy Solutions and Development Maps
STEP 5: Assess Outcomes and Track Results on Scorecards

For more information or to review examples of our assessment and development services, **visit** www.johnsoncontrols.com/institute or contact our Facility O&M Development professionals at 800-524-8540.

Our site-specific Skill Assessments are detailed to ensure an accurate review of your Facility O&M staff skills by job role. These can be self-assessments, supervisor-assessments, online testing, and/or hands-on performance assessments based on your facility needs. Any technical, customer service, or leadership job roles and skills can be assessed. Below are a few examples of client job roles.

- HVAC & Equipment Technicians
- Control & Automation Technicians
- Control & Automation Engineers
- Energy Management Specialists
- Work Management & Facility Analysts
- Utility Plant & Boiler Operators
- Facility Operators & Facility Controllers
- Electricians & Telecommunication Techs
- Steamfitters & Sheet Metal Workers
- Pipefitters & Stationary Engineers
- Plumbers & Refrigeration Mechanics
- Carpenters, Locksmiths, & Painters
- Building Engineers & Facility Engineers
- Operation & Maintenance Specialists
- Safety Coordinators & Groundskeepers
- Security and Fire System Technicians
- Service Coordinators & Billing Specialists
- Maintenance Management System Administrators
- Operation & Maintenance Supervisors
- Facility Managers & Directors

We work with your teams to design solutions and development maps for your facility needs. These solutions may include hands-on training, self-study learning, on site coaching, project assignments, O&M strategy updates, process improvements, organization updates, rewards, new equipment, performance support tools and cheat sheets.

HOW TO ENROLL IN A COURSE

Enroll Online

Register and purchase trainings online with credit cards, all at one location. **www.jcitraininginstitute.com**

View Our Course Schedule

Check classes that are open for enrollment and check the current status of a class. **www.johnsoncontrols.com/institute**

Browse Courses

Visit **www.johnsoncontrols.com/institute** for new classes and special discounts.

JOHNSON CONTROLS TRAINING INSTITUTE: COURSE APPLICATION

We encourage you to register for classes online at: www.jcitraininginstitute.com. This form should be used by those unable to register online, such as government agencies, and Johnson Controls branch offices. You can fill the form out then print this page and either email (cg-customer.registrar@jci.com) or fax (877-403-6625) it to the Johnson Controls Training Institute.

Student Information

Name of Applicant (Please Print)

Student E-mail Address (REQUIRED FOR CONFIRMATION / CANCELLATION NOTIFICATION)
Please provide a unique email address for each applicant.

Company/Organization Name

Company/ Organization Address (No P.O. Box)

City State Zip

Telephone Number ( ) - Fax Number ( ) -

Course Registration Information

Course Name

Course # Location

First Choice Date

Second Choice Date

Prerequisite Course Completion Date

Payment must be received 10 days prior to course start date.

◯ **Early Payment Discount** of $100 for each student's tuition if full payment is received 30 days prior to the start of the course.
****Early Payment Discount does NOT apply to any voucher payments or distance learning or to course #4720 Facility Explorer (FX) Supervisory Controllers Engineering Certification.****

◯ **5-pack** ◯ **10-pack** ◯ **Personal 3-pack Course Vouchers:** See page 5 for details

Payment Method Selected:

◯ Visa® or ◯ MasterCard® or ◯ American Express®

Exp. Date

_____ _____
(Signature) (Email address to send receipt)

◯ Check for $ (in U.S. Currency), payable to Johnson Controls Training Institute.

Please attach check and application together. Note: current prices may change.

Payment Policy
Please include check or credit card information with your application. To mail your application and payment, use Institute address (below). Thank you.

Tax Deduction
U.S. Treasury Regulation 1.162.5 permits an income tax deduction for educational expenses incurred to maintain or improve professional skills. Consult your tax advisor for details.

For Johnson Controls Branch Use Only

Installation Contract #

Salesperson Name

Cancellation Policy

Refunds are issued only if you notify the Institute at 414-524-4286 or 800-524-8540 that you cannot attend, no less than ten business days prior to the start of the course. You are liable for the entire course fee if cancellation is received after this deadline; you may substitute another student, or enroll in another session. Johnson Controls reserves the right to cancel classes and assumes no liability for expenses, all registrants will be notified at least ten days before the start of class.

Mail form and payments to:
Johnson Controls Training Institute/M45
507 East Michigan Street
Milwaukee, WI 53202

Telephone:
414-524-4286
800-524-8540

Fax:
877-403-6625

Internet:
www.johnsoncontrols.com/institute

For End Users and/or Authorized Building Controls Specialists/Contractors Only.

Johnson Controls Institute

2020 Class Schedule

January – June (July – December on reverse side)

FOR MORE INFORMATION: **www.johnsoncontrols.com/institute**

These dates are subject to change. Please verify the dates and location and look for new course offerings at www.jcitraininginstitute.com

Course Name	Course #	Page #	Start-End (Days)	Course Fee	January				February				March					April				May				June				
					6	13	20	27	3	10	17	24	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29
HVAC INDUSTRY COURSES																														
HVAC Mechanical Systems	210	13	M-F	$2,300	PHX						PHX							MKE									PHX			
Fundamental Control Strategies for HVAC Systems	215	13	M-F	$2,300		SC				TAM					IND					PHX							BAL				
HVAC Pneumatic Controls - Multi Manufacturer	221	14	Tu-Th	$1,800										MKE																
HVAC Equipment Maintenance	225	14	Tu-Th	$1,800															MKE											
OptiView ™ Control Panel	2100	15	Tu-W	$1,400														MKE									NF				
YK High Pressure Centrifugal Operations/Maintenance	2102	15	Tu-Th	$1,800		TAM				TAM				DAL							PHX										
YCAV Air Cooled Rotary Screw Liquid Chillers	2103	16	Tu-Th	$1,800				DAL														MKE						TAM		
Absorber Operations/Maintenance	2104	16	Tu-Th	$1,800		NF																								
YT/YK Centrifugal Chiller and Compressor Overhaul	2107	17	M-F	$2,700					NF																					
YPAL Series 100 Package RTU	2108	17	Tu-Th	$1,800																										
YVAA Air Cooled Screw Chiller	2111	18	Tu-Th	$1,800													DAL													
YLAA Chiller Start-Up and Troubleshooting	2114	18	Tu-Th	$1,800																										
BUILDING AUTOMATION SYSTEMS COURSES																														
Introduction to Metasys® N2 Controllers	4601	22	Tu-F	$2,300									BAL										BAL							
Metasys® DX-9100 Engineering	364	22	M-F	$2,300																										
Metasys® DX-9100 Operations/Troubleshooting	365	23	Tu-Th	$1,800																BAL										
Metasys® FEC Operations/Troubleshooting	4703	23	Tu-Th	$1,800		MKE		BOS			BAL	TAM	MKE			LOU		BOS	IND PHX									DAL		
Metasys® FEC Systems Engineering	4707	24	Tu-Th	$1,800								BAL		HOU		MKE	SC		TAM					BAL			SC		BOS	
Metasys® FEC Custom Programming	4704	24	Tu-Th	$1,800						IND													DAL							
Metasys® System Extended Architecture for Building Operators	388	25	M-W	$1,800	BAL MKE	TAM		SC		MKE	PHX	BOS DAL	IND LOU			TAM					BAL	BOS DAL HOU TAM	MKE			SC	IND	PHX	HOU	
Metasys® System Extended Architecture for Building Engineers	389	25	M-F	$2,300	BAL MKE	TAM		SC		MKE	PHX	BOS DAL	IND LOU			TAM					BAL	BOS DAL HOU TAM	MKE			SC	IND	PHX	HOU	
Metasys® System Extended Architecture Engineering and Setup	391	26	M-F	$2,300											MKE							PHX								
Metasys® System Extended Architecture Hardware and Troubleshooting	4718	26	M-F	$2,300																						MKE				
Metasys® System Extended Architecture Advanced Engineering	397	27	Tu-Th	$1,800																										
Facility Explorer® (FX) MSTP Field Controller Engineering	4714	27	M-F	$2,300							MKE						BAL							TAM						
Facility Explorer® (FX) Supervisory Controllers Engineering Certification	4720	28	M-F	$3,200									BOS																	
Instructor Led Distance Learning & eLearning Courses																														
Advanced PCT Programming	3001	30	Tu-Th	$1,200									DL															DL		
Metasys® Graphics Gerneation Tool	3002	30	Tu-Th	$1,200									DL																	
Introduction to Metasys® User Interface	3021	31	W	$600					DL																	DL				
Metasys® User Interface Graphics Editor	3022	31	Th	$600					DL																	DL				

KEY for INSTITUTE LOCATIONS: BAL (Baltimore) **BOS** (Boston) **DAL** (Dallas) **DL** (Distance Learning) **HOU** (Houston) **IND** (Indianapolis) **MKE** (Milwaukee) **LOU** (Louisville) **PHX** (Phoenix) **SC** (Southern California) **TAM** (Tampa) **NF** (New Freedom, PA)

Johnson Controls Institute

2020 Class Schedule

July – December (January – June on reverse side)

FOR MORE INFORMATION: **www.johnsoncontrols.com/institute**

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Course Name	Course #	Page #	Start-End (Days)	Course Fee	July				August					September				October				November					December			
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YK High Pressure Centrifugal Operations/Maintenance	2102	15	Tu-Th	$1,800	TAM								DAL				NF	MKE				TAM				NF		TAM		
YCAV Air Cooled Rotary Screw Liquid Chillers	2103	16	Tu-Th	$1,800							DAL									NF						PHX		NF		
Absorber Operations/Maintenance	2104	16	Tu-Th	$1,800											SC															
YT/YK Centrifugal Chiller and Compressor Overhaul	2107	17	M-F	$2,700												NF							NF				NF			
YPAL Series 100 Package RTU	2108	17	Tu-Th	$1,800							MKE								MKE									MKE		
YVAA Air Cooled Screw Chiller	2111	18	Tu-Th	$1,800								NF																		
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Metasys® FEC Operations/Troubleshooting	4703	23	Tu-Th	$1,800		SC		MKE		BAL			HOU							DAL	TAM									
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2020 Customer Training Catalog

www.johnsoncontrols.com/institute
800-524-8540, 414-524-4286
or
email us at cg-customer.registrar@jci.com

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